



UEENEEG103A – G104A
Select and Arrange Equipment for
General Electrical Installations

Worksheet Answers

Polytechnic West	Protection Devices and Applications	Section 1	SGB 01/2010
Electrical Trades	G103A & G104A Section 1	Worksheet Answers	CSU G007B

Wiring Systems

1. Protection against physical contact with live parts. Satisfy current carrying capacity, voltage drop etc. Reliability of connections. Adequate strength. Suit intended use. Protection mechanical damage and external influences. AS/NZS 3000 3.1.2
2. Any eight types of wiring system. e.g. Cable enclosures. TPS. Underground wiring. Aerial wiring. Catenary support. Emergency systems. Busbars. MIMS. Trunking. Earth Sheath Return, Trailing, Under carpet, Flexible cords.
3. Terminals or components may be alive unexpectedly.
4. Cables installed in air. Cables installed in thermal insulation. Cables buried direct in the ground. Cables installed in underground wiring enclosures. AS/NZS 3008.1.1 Clause 3.4
5. Grouping of cables. Ambient temperature
Depth of laying. Thermal resistivity of soil
Varying loads. Thermal insulation. Direct sunlight. Harmonic currents AS/NZS 3008.1.1 Clause 3.5
6. Ambient temperature. Mechanical injury. Damage due to exposure to weather, water, flora, fauna, seismic activity, excessive dampness, corrosive fumes, galvanic action, accumulation of dust, steam, oil, temperature, explosive atmospheres, vibration. AS/NZS 3000 3.3
7. Appropriate personnel are consulted.
Materials are obtained
Preparatory work is checked.
Tools and equipment are obtained
OH&S procedures are followed.
Isolation is checked
Unplanned events are responded to.
Ongoing checks of quality of work are undertaken
Inspection, testing and commissioning is completed
Work completion is notified

8. Category A Heavy-duty conduit - no protection

Category A enclosed in insulating wire – wiring enclosure encased in concrete

Category A Sheathed cables enclosed in galvanised steel – with no further mechanical protection

Category A Armoured sheathed cables or neutral screened cables buried directly in ground – without mechanical protection

Category B Medium-duty conduit - no protection

Category B Sheathed cables buried directly in ground – with mechanical protection

Clause 3.11.3.1 & Clause 3.11.3.2

9. Orange marker tape. Clause 3.11.4.5

10. Minimum depth in accordance with Table 3.6 Clause 3.11.4.4

11. No. clause 3.12.2.1(a).

12. 63A/Ø, 1Ø - 10mm², 3Ø - 6mm²

13. Close fitting ≤ 5mm, 50mm from other service opening, CSA ≤ 500mm² – 25mm

Dia. Clause 3.9.9.3

14. spread of fire kept to a minimum, close fitting ≤ 5mm, conduits, enclosures having ≤ 5mm free space. Clause 2.9.7 notes 1 - 4.

Polytechnic West	Protection Devices and Applications	Section 2	SGB 01/2008
Electrical Trades	G103A & G104A Section 2.	Worksheet Answers	CSU G007B

Special Situations

Standards

1. AS/NZS 3000. AS/NZS 3012 etc.

2. AS 3112. AS 3123 etc.

Public Buildings

3. No. HPBR Clause 29.

4. Near the main entrance. HPBR Clause 38.

5. Two. HPBR Clause 38(3).

Caravan Parks

6. No. AS 3001 Clause 2.1.3

7. 0.5 m. AS/NZS 3000 Table . With protection to AS 3001 Clause 2.2.2 (a)

Located at a depth of not less than 1.0 metres.

8. No. AS 3001 Clause 2.1.4

Boating Marinas

9. a corrosive atmosphere. water spray. water level variation. high temperatures. electrolytic corrosion.

10. Pontoons or jettys. AS 3004 Clause 2.1.2.2

11. AS 3004 (See AS 3000 Page 237)

Hazardous Areas

12. Zones 20, 21, 22 AS/NZS 3000 Clause 7.7.2.2(b)

13. Zones 0, 1, 2 AS/NZS 3000 Clause 7.7.2.2(a)

14. Hangars; Service stations; Flammable liquids and gas; Finishing processes; Flammable medical agents. etc.

15. Explosion or method of explosion protection.

16. Persons in control of installation. AS/NZS 3000 Clause 7.7.2.1.

17. Areas in which with an explosive atmosphere is present or may be expected to be present in quantities such as to require special precautions for the construction, installation and use of electrical equipment (See AS/NZS 3000 Clause 7.7).

18. AS/NZS 3003:2011 Patient treatment areas, 3009 Emergency power supplies, 3010,

19. WA Heritage Council

20. VIR – Vulcanised Indian Rubber.

Polytechnic West	Protection Devices and Applications	Section 3	SGB 01/2008
Electrical Trades	G103A & G104A Section 3	Worksheet Answers	CSU G007B

Special Situations – Safety Services

1. Ensures electrical supply (to safety services) is not inadvertently disconnected from electrical equipment that is required to operate during an emergency.
2. Wiring systems associated with safety services shall be capable of maintaining an adequate supply to such equipment when exposed to fire. Comply with AS/NZS 3013 with a WS classification. Clause 7.2.7.1 & 7.2.7.2.
3. No. AS/NZS 3000 Clause 7.2.2.1
4. No. AS/NZS 3000 Clause 7.2.9.1(c)
5. No. AS/NZS 3000 Clause 7.2.9.3
6. Ionising & Photoelectric. Kitchen - gas stove/oven combustion products, electric ovens/grills, unflued gas space or water heaters, garages – car combustion fumes, etc.
7. Use of lighting final subcircuit provides monitoring that the mains power supply is available. Failure of lighting final subcircuit in an electrical installation would be indicated by the non-operation of luminaires. Clause 4.6 Notes 1

Polytechnic West	Protection Devices and Applications	Section 4	SGB 01/2008
Electrical Trades	G103A & G104A Section 4	Worksheet	CSU G007B
		Answers	

Delineation and Selection of Equipment for Damp Situations

1. **Figure 6.12, 6.13, 6.14**
2. **Figure 6.2, 6.4.**
3. **4 mm². Clause 5.6.2.5, 5.6.2.6, 5.6.3.2(b).**
4. **≤0.45m high (above ground) and ≤1.25m internal rim (from the water); or beneath a barrier (≤0.5m from the edge). AS/NZS 3000 Table 6.2, Zone 1**
5. **ELV from a double wound transformer. AS/NZS 3000 Clause 6.3.4.5**
6. **Prevent siphoning and entry of moisture AS/NZS 3000 Clause 6.3.4.2**
7. **Within 1.25m of the edge of the pool – arm's reach. AS/NZS 3000 Clause 5.6.2.6**
8. **No – Zone 2 and RCD protected, in a cupboard. AS/NZS 3000 Table 6.1**
9. **IPX5 AS/NZS 3000:2000 Table 6.2, Clause 6.4.4.1(b)**
10. **So moisture cannot enter or be retained.
AS/NZS 3000 Clause 6.6.4.4.1**
11. **Wiring systems that are not affected by method of hosing; materials; temperature or pressure and do not provide places where moisture can accumulate. Does not provide channels or pockets through moisture might pass. AS/NZS 3000 Clause 6.7.4.3**
12. **Water less than 0.3 m deep; suitable means to restrict entry of persons.
AS/NZS 3000 Clause 6.4.1(b)**
13. **170 degrees C. AS/NZS 3000 Clause 6.5.4.2(c)**

Polytechnic West	Protection Devices and Applications	Section 5	SGB 01/2008
Electrical Trades	G103A & G104A Section 5	Worksheet Answers	CSU G007B

Selection of Equipment for ELV Installations.

- 1. Separated Extra Low Voltage and Protected Extra Low Voltage.**
- 2. No. AS/NZS 3000 Clause 7.5.5.**
- 3. 10% AS/NZS 3000 Clause 7.5.7.**
- 4. Plugs not to enter outlets from other systems.**
Outlet not to accept plugs from other systems.
No earthing contact in outlets. AS/NZS 3000 Clause 7.5.10.
- 5. There is no specified depth. AS/NZS 3000 Clause 7.5.11.3**
- 6. AS/NZS 3000 Clause 7.5.11.1 3.9.8.3.**
- 7. No. AS/NZS 3000 Clause 7.5.10**

Polytechnic West	Protection Devices and Applications	Section 6	SGB 01/2008
Electrical Trades	G103A & G104A	Worksheet 1 Answers	CSU G007B

Installation Test Documentation

1. Preliminary Notice and Completion Notice.
2. Electrical Safety Certificate.
3. 3 days before.
4. 3 days after.
5. The licensed electrical worker.
6. No more than 28 days after.
7. No. It must be a licensed A Grade Electrical Mechanic.
8. To allow details to be traced back to their source in the event of a future query.

Polytechnic West	Protection Devices and Applications	Section 6	SGB 01/2008
Electrical Trades	G103A & G104A Section 6(2)	Worksheet 2 Answers	CSU G007B

Commissioning Installations

1. The electrical contractor.
2. Commissioning involves ensuring correct operation. Testing involves using instruments to ensure that mandatory and specified technical requirements have been met before power is applied.
3. Work clearance procedures. Isolation procedures. Gas and vapour precautions. Monitoring/testing procedures. Use of protective equipment and clothing. Risk assessment mechanisms. Use of codes of practice.
4. If a device is installed which does not meet the specifications.